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(71) Applicant(s)
Barber Wilsons & Company Limited
(Incorporated in the United Kingdom)
Crawley Road, Westbury Avenue, Wood Green,
London, N22 6AH, United Kingdom

(72) Inventor(s)
John Halford Wilson

(74) Agent and/or Address for Service
Forrester Ketley & Co
Forrester House, 52 Bounds Green Road, LONDON,
N11 2EY, United Kingdom

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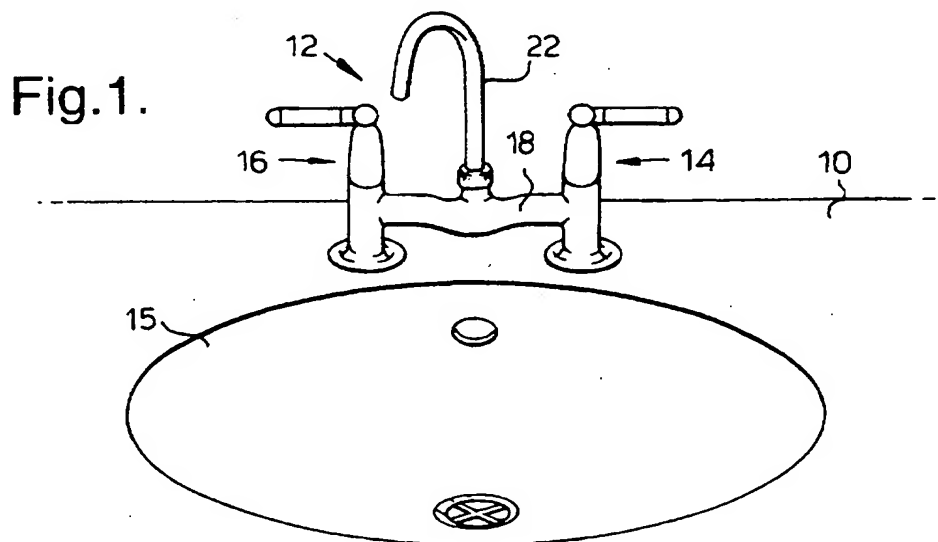
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GB 0654527 A EP 0775860 A2 US 4429422 A

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(54) Abstract Title
Mixer tap

(57) A pillar sink mixer comprises cold and hot tap pillars 14, 16 projecting above a horizontal panel 10. The pillars are spaced apart and a tubular connection 18 is provided between the pillars, from the middle of which extends a spout 22 of inverted J shape. The mixer has a hand spray device 60. The pillars have respective valves 28 controlling flow of cold or hot water to mixer chamber 60 below panel 10. Mixer chamber 60 has an outlet connected to the spray 60 by hose 62 and incorporates a valve (88, 90, 92, figure 3) which cuts off supply of water to upper parts of the pillars when spray 60 is operated. The valve comprises head (88) forced off its seat when there is flow to spout 22 but no flow to the spray 60. When there is flow to the spray 60 head (88) is seated due to the pressure drop around a plate (92) connected to head (88). Valve assemblies 28 have a first inlet 40 connected to a water supply, a second inlet 44 and a first outlet 42 connected to the mixing chamber and a second outlet connected to a respective pillar. The first inlet and outlet 40, 42 are isolated from one another by a seal which has a spindle extending through it.



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Fig.1.

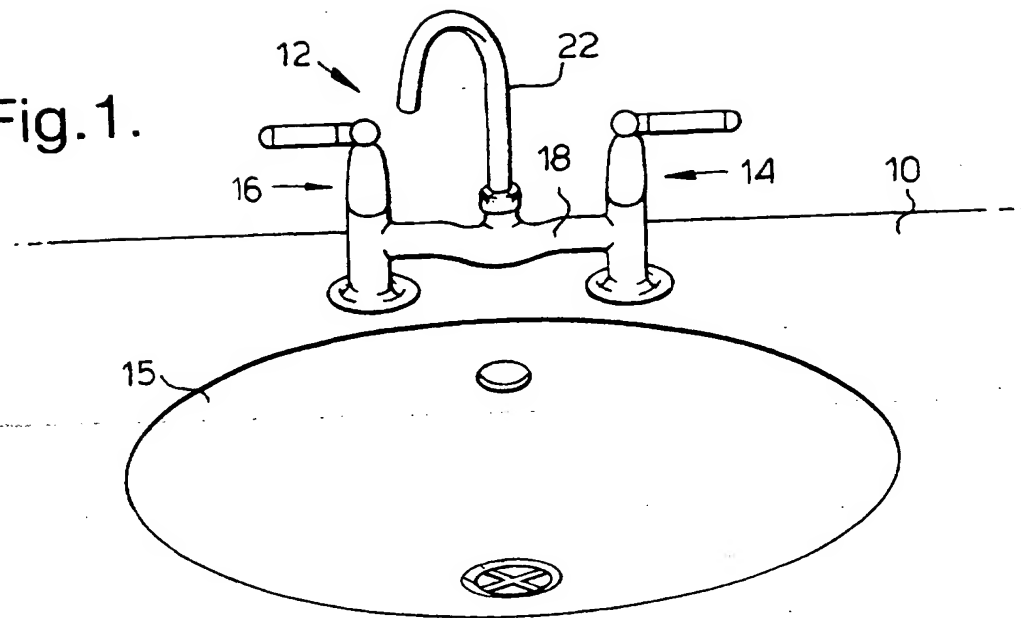


Fig.3.

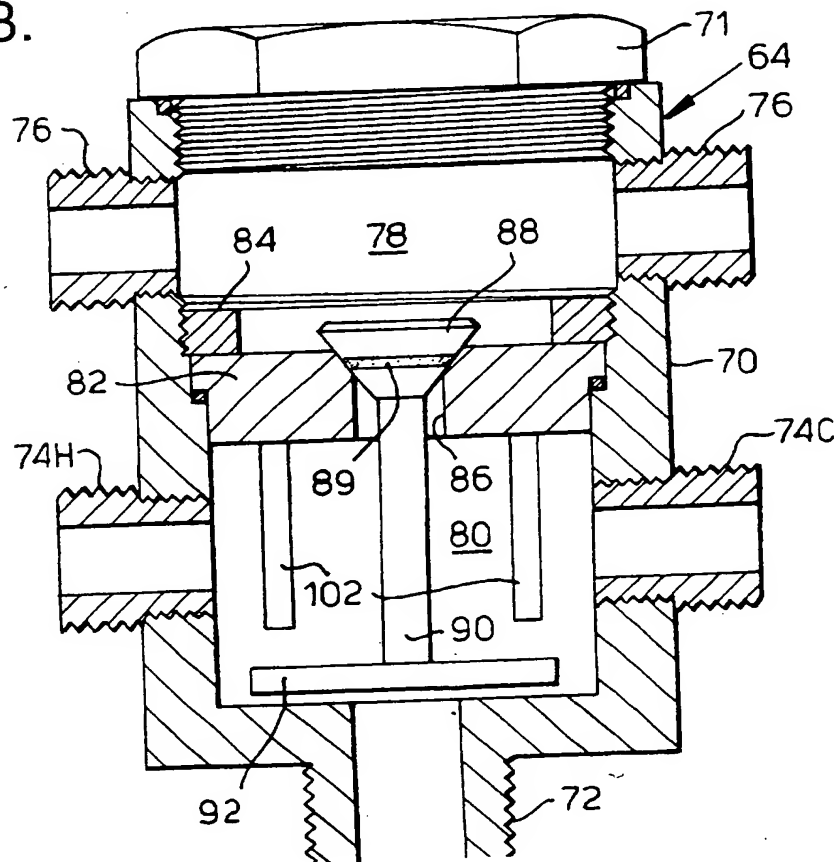
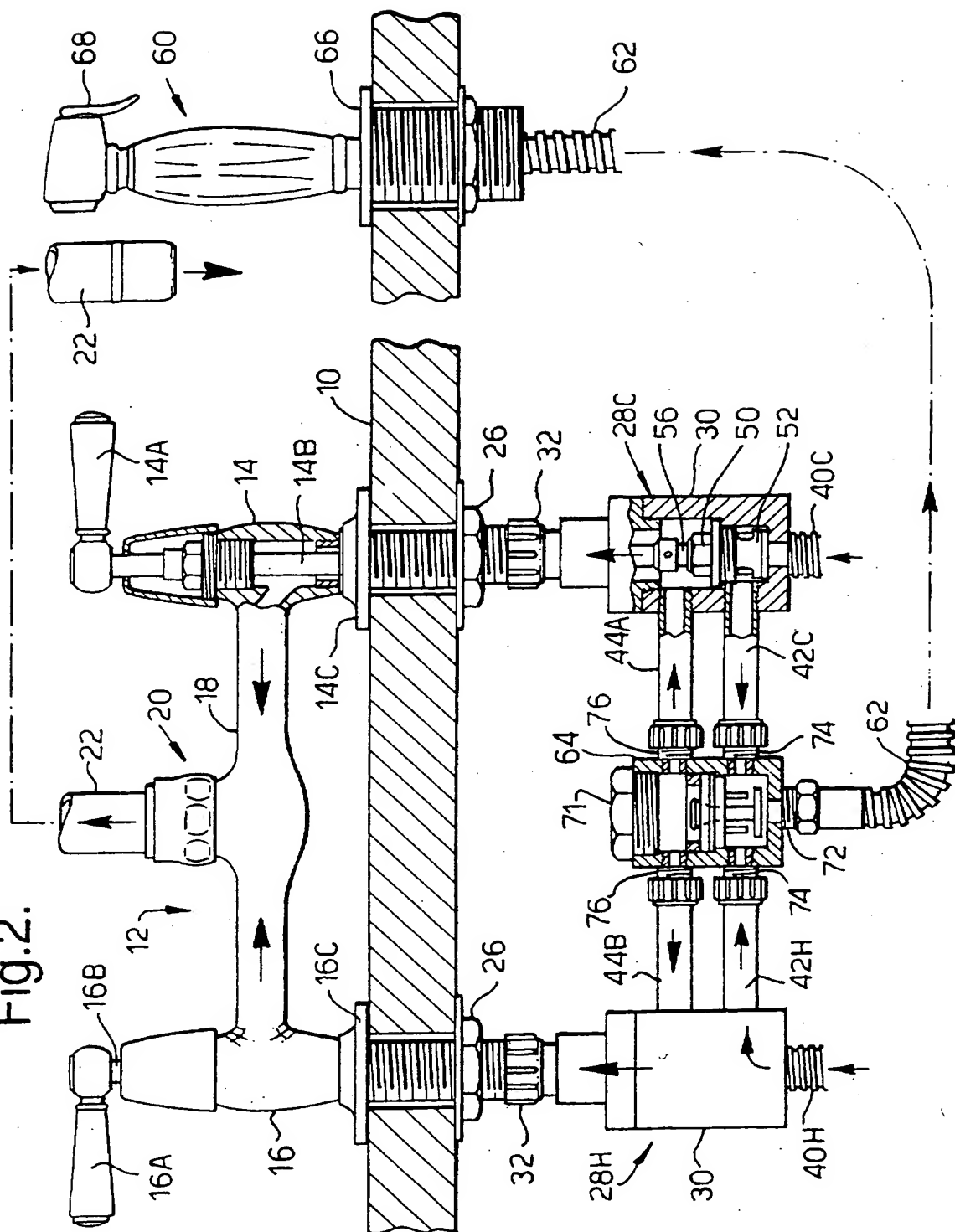


Fig. 2.



DESCRIPTION OF INVENTION

Title: "Improvements in or relating to taps"

THIS INVENTION relates to taps and, in particular, to a tap arrangement comprising a hot and cold water mixing assembly of the kind comprising, in addition to a hot tap and a cold tap, a manually operable spray nozzle carried at the end of a flexible hose. Such tap arrangements are often utilised, for example, in twin-sink units in kitchens, where the hand-operated spray is used for a preliminary cleansing of kitchen ware in one sink before the ware is transferred to the other sink for a final washing. Whilst there has been a trend, in modern kitchens, for taps and associated fittings to be concealed so far as possible and for the appearance of such parts as are visible to be made as simple and "streamlined" as possible, there is, nonetheless, a demand for tap fittings of a more traditional or "period" appearance.

One aspect of the above-noted demand is a demand for a hot and cold water tap/mixer assembly of the kind illustrated in Figure 1 comprising a cold tap pillar 14 and a hot tap pillar 16 in spaced-apart relationship with the exposed bodies of the two taps being connected by a simple tubular connection 18 from the middle of which extends, generally in the form of a loop of inverted J-shape, a unitary single outlet spout or swan-neck 22, the outlet of which is positioned over a sink 15 to discharge into the sink a mixture of hot and cold water, the proportions of the mixture being determined by the settings of the taps. Such an arrangement is herein referred to, for convenience, as a pillar sink mixer.

However, with a pillar sink mixer in this traditional form, there has, up till now, been a problem in that it has been impossible, or at least impracticable, to provide, additionally, a spray nozzle with a flexible hose, with the water supply to the nozzle, and the temperature of the water so supplied, being controlled by the taps of the pillar sink mixer in the same way as with other tap arrangements incorporating such spray nozzles. It is among the objects of the present invention to provide a solution to this problem.

According to one aspect of the invention there is provided a pillar sink mixer comprising:

- a hot tap pillar and a cold tap pillar in spaced-apart relationship,

- each pillar having an upper end and a lower end and a mounting pedestal intermediate its upper and lower ends, the mounting pedestals providing abutment surfaces lying in a common plane for engagement with a mounting surface provided with holes through which portions of the pillars below said mounting pedestals extend,

- each tap pillar including a housing, above the respective mounting pedestal, connected with the corresponding housing of the other tap pillar by a hollow conduit, above the level of said mounting pedestals,

- the mixer including a single flow nozzle extending from the middle of said interconnecting hollow conduit,

- each said pillar, including said housing thereof, being hollow to provide a passage for water flow therethrough, to said hollow conduit,

- the mixer including a hand spray device connected with a flexible hose,

- and wherein each said tap pillar carries a respective valve, below said mounting pedestal, having a respective first connector for connection with a hot or cold water source, and having a respective second connector and a respective

third connector above the second connector, each third connector communicating with the respective said passage for water flow,

each said valve being operable by a respective spindle extending through the respective pillar from a respective tap handle at the top of the pillar, and each said valve being operable alternatively to provide a fluid connection between said first connector and said second connector thereof, or to cut off said connection,

sealing means being provided between said second and third connectors of each said valve and the respective said spindle extending sealingly through said sealing means, said sealing means preventing direct flow, within the respective valve, between the second and third connectors,

the arrangement being such that a path for water flow is provided within each tap pillar and through the interconnecting conduit, from the respective third connector to said single flow nozzle,

the mixer further including a mixing chamber, a respective conduit extending to the mixing chamber from each said second connector and a respective conduit extending from the mixing chamber to each said third connector,

and wherein said flexible hose is connected to said mixing chamber.

According to another aspect of the invention there is provided a sink mixer comprising a mixing chamber, a hot tap controlling the supply of water from a hot water source to an inlet to the mixing chamber, a cold tap controlling the supply of water from a cold water source to an inlet to the mixing chamber, a first outlet for water from the mixing chamber, a second outlet for water from the mixing chamber, said second outlet being connected to a nozzle having a valve associated therewith, shuttle valve means being provided within the mixing chamber, arranged in one position to cut off water flow from the mixing chamber to the first outlet and in another to permit such flow, the arrangement

being such that when the valve of said second nozzle is open, water flow from said mixing chamber to said second nozzle sets up a pressure differential within the mixing chamber across said shuttle valve biasing the latter into said one position cutting off fluid flow from the mixing chamber to the first outlet, whilst when the valve of said second nozzle is closed, the shuttle valve can be displaced, by the water pressure within the mixing chamber, to its position permitting flow to the first outlet.

An embodiment of the invention is described below by way of example with reference to the accompanying drawings in which:

FIGURE 1 is a schematic perspective view of a conventional pillar sink mixer;

FIGURE 2 is a side view, partly in section, of a kitchen installation incorporating a pillar sink mixer in accordance with the invention, and

FIGURE 3 is a diagrammatic sectional view of a resistance sensitive diverter valve incorporated in the arrangement of Figure 2.

In Figure 2, parts corresponding to parts in Figure 1 have the same references. Referring to Figures 1 and 2, reference 10 indicates, (in section in Figure 2), a horizontal panel which may typically be a horizontal flange of a sink assembly or a portion, adjoining a sink, of a slab providing a worksurface in a kitchen. The pillar sink mixer 12 in accordance with the invention, shown in Figure 2, comprises a housing component of approximately "H" shape providing two horizontally spaced hollow pillar parts 14 and 16 connected by a tubular horizontal limb 18. The limb 18 has a fitting or union 20 mid-way along from which extends upwardly a vertical root portion of the outlet spout or swan-neck 22 (shown only partially in Figure 2) and which is of conventional form, being,

like its counterpart in Figure 1, in the shape of an inverted "J" to provide, as with the arrangement in Figure 1, a single downwardly-directed water outlet positioned over the sink. The arrangement may be such that the swan neck 22 can be pivoted about the vertical axis of the union 20, whilst maintaining a water-tight seal between the swan-neck 22 and the remainder of the fitting. The fitting illustrated incorporates two taps, namely a hot tap and a cold tap each controlled by a respective lever 16A, 14A, by which a respective tap operating spindle 14B, 16B, extending vertically through the respective pillar 14, 16, may be turned to operate a respective water valve 28.

The two pillars 14, 16, extend through respective vertical bores through the flange 10. The pillars 14, 16, have respective pedestals 14C, 16C, which engage the upper surface of the flange 10 and conceal the bores through which the portions of the pillars below these pedestals extend. In manner known *per se*, the portions of the pillars extending below the pedestals are externally screw-threaded and receive conventional retaining nuts 26 which are screwed up so that the flange 10 is clamped between the pedestals 14C, 15C and the nuts 26.

In the arrangement shown in Figure 2, a respective valve assembly 28 is secured to the lower end of each of the pillars 14, 16, respectively. Each of these valve assemblies incorporates a respective casing 30 releasably connected by a screw-up union 32 with the lower end of the externally screw-threaded lower part of the respective pillar. Each casing 30 provides an inlet stub or connector 40, an outlet connector 42 and a further inlet connector 44 at a higher level than the outlet 42. Each casing 30 accommodates a screw-down valve mechanism carried by a plug 50 which is screwed into a screw threaded counterbore in the respective casing 30, the mechanism including a screw-down

valve member 52 below the plug 50, the plug 50 accommodating a valve operating mechanism, known *per se*, including a valve-operating stub shaft 56 extending axially vertically upwardly through the plug 50, the shaft 56 being rotatable sealingly within the plug 50. A socket at the lower end of the respective operating spindle 14B, 16B, receives, non-rotatably with respect thereto, the upper end of the respective stub shaft 56, the operating spindle 14B, 16B being, of course, co-axial with the respective stub shaft 56. In each valve 28, the plug 50, valve member 52, valve operating mechanism and shaft 56 thus, together with the lower part of the casing 30, are equivalent in function and operation to a conventional screw down water tap in that when the spindle 14B or 16B and the respective stub shaft 56 are rotated in one direction to raise the valve member 52 from its valve seat, (formed around the upper end of the bore through the inlet stub 40), a passage is open for flow of water from the inlet 40 past the valve seat to the outlet 42. The space within the interior of the respective pillar 14, 16, above the plug 50 merely forms a conduit for water flow, and there is no direct connection between this conduit and the region below the plug 50 within the casing 30. In the preferred embodiment, the valves 28 are of the type incorporating ceramic discs and the design of valves 28 (known *per se*) is such that valve members 52 are moved from their fully open to their fully closed positions in a quarter turn of the respective stub shafts 56 and corresponding handles 14A, 16A, about their respective vertical axes, but it will be understood that other types of tap or water valve may be used.

The apparatus shown also includes a hand spray 60 which is connected by a flexible hose 62 with a mixer chamber 64, the hand spray 60, when not in use, resting within a socket 66 mounted, as shown, in an aperture in the flange or slab 10 so that when required the hand spray can be lifted from its socket to be directed at items to be cleaned. The hand spray 60 incorporates a water valve, in known fashion, operable by a thumb lever 70.

Referring to Figures 2 and 3, the mixer chamber 64 comprises a generally cylindrical housing 70 having an outlet stub 72 at its lower end. The interior of housing 70 is divided into an upper chamber 78 and a lower chamber 80 by a valve seat member 82 which spans the interior of the housing 70 and is held in place by a retaining ring 84 screw-threadedly engaged with internal screw threading in an upper portion of the housing 70. The valve seat member 82 has a central passage 86 therethrough terminating, at its upper end, in a conical valve seat which cooperates with a complementary conical head 88 of a poppet valve having a stem 90 extending downwardly, through aperture 86 into chamber 80 and carrying at its lower end a horizontal circular plate 92 which is spaced slightly from the lower wall of the chamber 80, in a position overlying the bore through the outlet connector 72, when the poppet valve is in its position in which the valve head 88 is firmly engaged with the valve seat provided by seat member 82. As indicated, a sealing "O" ring 89 may be provided around the valve head 88. The upper end of housing 70 is closed by a screw cap 71. The mixer chamber has a first pair of lateral inlets 74 adjacent the lower end of the housing, connecting with the lower chamber 80, and a pair of lateral outlets 76 at a higher level, connecting with the upper chamber 78. Abutment members 102 projecting downwardly from the body of the valve seat member 82 limit upward movement of the valve and thus upward movement of the plate 92 away from the outlet through connector 72.

As shown in Figure 2, the outlets 42 from the valves 28 are connected to respective ones of inlets 74, whilst the inlets 44 of valves 28 are connected to respective ones of the outlets 76 of the housing 70. When the valve in the handspray is not actuated, so that no water can flow to the handspray from the mixing chamber 64, if either or both of valves 28 is open, water entering the chamber 80 from the outlets 42, *via* the inlets 74, can lift the valve 88, 90, 92 to

allow water to pass from the chamber 80 through the bore 86 into the chamber 78 and thence to the inlets 44 *via* the outlet 76, from whence the water passes within the pillars 14, 16 and through the horizontal limb 18 to the swan neck 22 for discharge to the sink. (It will be understood that, in principle, whatever the positions of the taps 14A, 16A, any water flowing from chamber 78 will pass equally through both of the pillars 14, 16, and will be at the same temperature within both pillars). If, when either or both of the tap valves 28 is/are open, the thumb-operated valve on the spray head 70 is operated, the consequent pressure drop around the edges of the plate 92 as water flows from chamber 80 through the outlet connector 72 to the hand spray will produce a net force acting on the plate 92 such as to pull the valve head 88 into engagement with its valve seat, because the relative diameters of the plate 92 and the valve head 88 are such as to ensure that the valve 88/90/92 is moved into its lowermost position when the hand spray is operated.

As a result of the arrangement described, when the spray is operated, the water supply to the swan-neck 22 is automatically cut off.

In the present specification "comprises" means "includes or consists of" and "comprising" means "including or consisting of".

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1. A pillar sink mixer comprising:

a hot tap pillar and a cold tap pillar in spaced-apart relationship,

each pillar having an upper end and a lower end and a mounting pedestal intermediate its upper and lower ends, the mounting pedestals providing abutment surfaces lying in a common plane for engagement with a mounting surface provided with holes through which portions of the pillars below said mounting pedestals extend,

each tap pillar including a housing, above the respective mounting pedestal, connected with the corresponding housing of the other tap pillar by a hollow conduit, above the level of said mounting pedestals,

the mixer including a single flow nozzle extending from the middle of said interconnecting hollow conduit,

each said pillar, including said housing thereof, being hollow to provide a passage for water flow therethrough, to said hollow conduit,

the mixer including a hand spray device connected with a flexible hose,

and wherein each said tap pillar carries a respective valve, below said mounting pedestal, having a respective first connector for connection with a hot or cold water source, and having a respective second connector and a respective third connector above the second connector, each third connector communicating with the respective said passage for water flow,

each said valve being operable by a respective spindle extending through the respective pillar from a respective tap handle at the top of the pillar, and each said valve being operable alternatively to provide a fluid connection between said first connector and said second connector thereof, or to cut off said connection,

sealing means being provided between said second and third connectors of each said valve and the respective said spindle extending sealingly through said sealing means, said sealing means preventing direct flow, within the respective valve, between the second and third connectors,

the arrangement being such that a path for water flow is provided within each tap pillar and through the interconnecting conduit, from the respective third connector to said single flow nozzle,

the mixer further including a mixing chamber, a respective conduit extending to the mixing chamber from each said second connector and a respective conduit extending from the mixing chamber to each said third connector,

and wherein said flexible hose is connected to said mixing chamber.

2. A pillar sink mixer according to claim 1 including a diverter valve in said mixer chamber arranged to cut off said third connectors from communication with said second connectors *via* the mixing chamber when said hand spray device is operated to discharge water therefrom.

3. A sink mixer comprising a mixing chamber, a hot tap controlling the supply of water from a hot water source to an inlet to the mixing chamber, a cold tap controlling the supply of water from a cold water source to an inlet to the mixing chamber, a first outlet for water from the mixing chamber, a second outlet for water from the mixing chamber, said second outlet being connected to a nozzle having a valve associated therewith, shuttle valve means being provided within the mixing chamber, arranged in one position to cut off water flow from the mixing chamber to the first outlet and in another to permit such flow, the arrangement being such that when the valve of said second nozzle is open, water flow from said mixing chamber to said second nozzle sets up a pressure differential within the mixing chamber across said shuttle valve

biasing the latter into said one position cutting off fluid flow from the mixing chamber to the first outlet, whilst when the valve of said second nozzle is closed, the shuttle valve can be displaced, by the water pressure within the mixing chamber, to its position permitting flow to the first outlet.

4. A pillar sink mixer substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

Amendments to the claims have been filed as follows

1. A pillar sink mixer comprising:
 - a hot tap pillar and a cold tap pillar in spaced-apart relationship,
 - each pillar having an upper end and a lower end and a mounting pedestal intermediate its upper and lower ends, the mounting pedestals providing abutment surfaces lying in a common plane for engagement with a mounting surface provided with holes through which portions of the pillars below said mounting pedestals extend,
 - each tap pillar including a housing, above the respective mounting pedestal, connected with the corresponding housing of the other tap pillar by a hollow conduit, above the level of said mounting pedestals,
 - the mixer including a single flow nozzle extending from the middle of said interconnecting hollow conduit,
 - each said pillar, including said housing thereof, being hollow to provide a passage for water flow therethrough, to said hollow conduit,
 - the mixer including a hand spray device connected with a flexible hose,
 - and wherein each said tap pillar carries a respective valve, below said mounting pedestal, having a respective first connector for connection with a hot or cold water source, and having a respective second connector and a respective third connector above the second connector, each third connector communicating with the respective said passage for water flow,
 - each said valve being operable by a respective spindle extending through the respective pillar from a respective tap handle at the top of the pillar, and
 - each said valve being operable alternatively to provide a fluid connection between said first connector and said second connector thereof, or to cut off said connection,

sealing means being provided between said second and third connectors of each said valve and the respective said spindle extending sealingly through said sealing means, said sealing means preventing direct flow, within the respective valve, between the second and third connectors,

the arrangement being such that a path for water flow is provided within each tap pillar and through the interconnecting conduit, from the respective third connector to said single flow nozzle,

the mixer further including a mixing chamber, a respective conduit extending to the mixing chamber from each said second connector and a respective conduit extending from the mixing chamber to each said third connector,

and wherein said flexible hose is connected to said mixing chamber.

2. A pillar sink mixer according to Claim 1 including a diverter valve in said mixer chamber arranged to cut off said third connectors from communication with said second connectors *via* the mixing chamber when said hand spray device is operated to discharge water therefrom.

3. A pillar sink mixer substantially as hereinbefore described with reference to and as shown in the accompanying drawings.





Application No: GB 0008524.1
Claims searched: 1 and 2

Examiner: Tim James
Date of search: 11 July 2001

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.S): F2V (VV10, VP30)
Int CI (Ed.7): F16K (11/20)
Other: On-line databases: WPI, EPODOC, JAPIO

Documents considered to be relevant:

| Category | Identity of document and relevant passage | Relevant to claims |
|----------|--|--------------------|
| A | GB 0654527 (Storrie) see figures 1 and 2 | ----- |
| A | EP 0775860 A2 (Emhart) see column 4 line 26 - column 5 line 19 | ----- |
| A | US 4429422 (Wareham) see the figures | ----- |

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| N | Document indicating lack of novelty or inventive step | A | Document indicating technological background and/or state of the art. |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category. | P | Document published on or after the declared priority date but before the filing date of this invention. |
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